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Dated: May 14, 2008

Signature: Donna Dobson
(Donna Dobson)

Docket No.: 50715/P004US/10311738
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
F. C. Greer et al.

Application No.: 10/662,992 — Confirmation No.: 2249

Filed: September 15, 2003 — Art Unit: 1754

For: PROCESS FOR THE PRODUCTION OF METAL FLUORIDE MATERIALS — Examiner: N. Y. M. Nguyen

REPLY BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Further to 37 C.F.R. § 41.41, Applicants file this Reply Brief in response to and within two months of Examiner's Answer mailed March 14, 2008.

This brief contains items under the following headings:

I. Grounds of Rejection to be Reviewed on Appeal
II. Argument
III. Claims Appendix

I. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Claims 1 – 24, 26, and 28 – 30 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

B. Claims 1 – 34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 4,034,070 to Wojtowicz et al. (hereinafter "Wojtowicz") in view of U.S. Patent 4,938,945 to Mahmood et al. (hereinafter "Mahmood"), optionally in view of U.S. Patent 5,286,882 to Zuzich et al. (hereinafter "Zuzich").

II. ARGUMENT

A. Introduction

Because 37 C.F.R. §41.41 does not specify a format for Reply Briefs, Appellant presents the arguments below in a format organized to counter the Response to Arguments section of the Examiner's Answer. The format of this Reply does not cause claims to be considered together or separately other than as presented in the Appeal Brief. Appellants believe that this format eliminates repetition and is convenient to the Board.

B. Rejections under 35 U.S.C. § 112

1. Summary

Appellee rejects claims 1 – 24, 26, and 28 – 30 under 35 U.S.C. § 112 as being indefinite.[1] In reviewing a claim for compliance with 35 U.S.C. § 112, Appellee must consider whether the claim as a whole apprises one of ordinary skill in the art of its scope.[2] In other words, a claim is definite if it notifies others as to what constitutes infringement of the patent.[3] At issue in the current rejection for indefiniteness is whether it is proper for Appellee to reject the claims as being indefinite because the specification does not explicitly state that "metal" includes "metal" and "metal compounds" though the claims clearly set out this meaning.

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[1] Examiner's Answer, pages 4 – 5.
[2] *See, e.g., Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379, 55 USPQ2d 1279, 1283 (Fed. Cir. 2000).
[3] *Id.*

2. A claim is not indefinite for not explicitly stating in the specification that which is shown in the claim

The Patent and Trademark Office is required to interpret claims in light of the specification and the words of the claims themselves.[4] Proper claim construction does not limit words to their literal meaning but, instead, applies an ordinary meaning in the context of the whole application. For example, in *In re Cortright*,[5] the Board construed the claim limitation "restore hair growth," in light of the applicant's disclosure, as viewed by one of ordinary skill in the art, as meaning to require only some increase in hair growth as opposed to a literal construction which would require the hair being returned to its original state of a full head of hair. Additionally, in *Ortho-McNeil Pharmaceutical, Inc. v. Mylan Laboratories, Inc.*,[6] the Federal Circuit recently affirmed a district court's construction of the word "and" to mean "or" in a claim in light of the language of the claim, independent claims and the specification.

Here, Appellee contends that "metal" means pure metal.[7] Further, Appellee contends that because metal and metal compounds are separately recited in the specification, "metal" in the claims does not encompass "metal compounds."[8] Contrary to this latter contention, having disclosed the reactions between hydrofluoric acid with metal and metal compounds, one skilled in the art would reasonably interpret "metal" as including metal compounds if the claims themselves show that meaning.

It is without dispute that because claim 3 (which depends from claim 1) recites, "wherein the anhydrous metal is a metal compound," then the term "metal" recited in claim 1 must include metal compounds.[9] In fact, Appelle's rejection in claim 1 affirms that "metal" in the claims include metal compound:

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[4] *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364, 70 USPQ2d 1827 (Fed. Cir. 2004)
[5] 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999).
[6] 2007-1223 (Fed. Cir. 3-31-2008).
[7] Examiner's Answer, page 5.
[8] Examiner's Answer, page 10.
[9] *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1313, 75 USPQ2d 1321, 1326 (Fed. Cir. 2005) (en banc) (providing that the meaning of claim language may be evidenced by a variety of sources, including "the words of the claims themselves").

> The term "metal" in claim 1 is used by the claim to include "metal compound" (note claim 3), while the accepted meaning is *pure* "metal" or possibly a metal alloy.[10]

Therefore, Appellee concurs that the claims use "metal" to include metal compounds, but Appellee is still concerned that this meaning was not explicit in the specification. An explicit statement in the specification, however, is not necessary if the meaning of the term is clear from the claims.[11] Moreover, the specification uses the term metal, not only as elemental metal but also, to include metal compounds. For example, paragraph [0015] provides: "The present invention differs from the prior art processes by adding the solid metal reactant to the liquid anhydrous hydrofluoric acid reactant." (emphasis added). Immediately thereafter, paragraph [0016] describes the invention including reacting ferric trifluoride—a metal compound. This contradicts Appellee's contention that the application does not indicate that "metal" refers to a metal-containing compound. In sum, in describing the reaction of metal and metal compounds reacting with hydrofluoric acid in the specification, and in drafting of claims 1 and 3 as Appellants did, Appellants have conveyed to the public the scope of the claims. Because the scope of the claims is clear, Appellants respectfully request that the Board reverse the rejection, under 35 U.S.C. § 112, of claims 1 – 24, 26, and 28 – 30.

C. Rejections under 35 U.S.C. § 103(a)

1. Summary

Appellee rejects claims 1 – 34 under 35 U.S.C. § 103(a) as being obvious in view of Wojtowicz and Mahmood or Wojtowicz and Zuzich. The United States Patent and Trademark Office bears the burden of factually supporting any prima facie conclusion of obviousness.[12] An obviousness rejection must take into account the differences between applied art and the rejected claims.[13] Courts disapprove of hindsight reconstruction to

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[10] Examiner's Answer, page 5.
[11] *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313, 75 USPQ2d 1321, 1326 (Fed. Cir. 2005) (en banc) (The ordinary and customary meaning of a term may be evidenced by a variety of sources, including "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.")
[12] . M.P.E.P. § 2142; *In re Peehs*, 612 F.2d 1287, 204 USPQ 835, 837 (CCPA 1980).
[13] *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 15 - 17 (1966).

discount these differences.[14] Where the differences set the claims apart from the applied art, the claims are patentable.[15] One issue that emanates from the current rejections is whether art which describes adding hydrofluoric acid to metal can be the basis of the obviousness rejection of claims that require adding metal to hydrofluoric acid. A second issue is whether art that describes a completely different chemical reaction than that of the claims is properly used to show obviousness of the claims.

2. Mahmood's "adding" step is the opposite of that in the claims

Appellee's use of Mahmood as art stems from Examiner conceding that Wojtowicz does not teach the step in the claimed method requiring adding anhydrous metal to hydrofluoric acid in intervals.[16] To address this deficiency of Wojtowicz, Examiner relies on Mahmood.[17] But in Mahmood, hydrofluoric acid is added to a metal compound.[18] Faced with this fact, Examiner states Mahmood is not relied on for teaching the order of adding the reactants.[19] Examiner then argues Mahmood is relied on for teaching adding in intervals only.[20]

To rely on Mahmood for teaching adding in intervals while ignoring that Mahmood teaches adding the hydrofluoric acid to metal instead of metal to hydrofluoric acid is to use hindsight reconstruction to selectively choose portions of Mahmood in an attempt to establish that the claims are obvious. Courts have consistently warned of such hindsight reconstruction.[21] Here, Appellee has selectively used the purported "adding in intervals teaching" of Mahmood despite the fact that Mahmood describes adding hydrofluoric acid to metal. Ignoring differences between the applied art and claims is especially significant in this

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[14] "A fact finder should be aware . . . of the distortion caused by hindsight bias . . . ."). *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S.____ (2007) (citing *Graham*).

[15] *See United States v. Adams* 383 U.S. 39, 48 (holding that the Government erred in concluding that wet batteries are old in the art because, among other things, "the fact that the Adams battery is water-activated sets his device apart from the prior art.")

[16] Examiner's Answer, page 7.

[17] Examiner's Answer, page 9.

[18] Col. 3, lines 38 – 45 (stating, "Liquid HF, when added on top of the $FeCl_3$, forms a blanket which protects the reaction mass and especially the FeF_3 product from contact with oxygen or reactive agents such as atmospheric water.").

[19] Examiner's Answer, page 11.

[20] *Id.*

[21] *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S.____ (2007) (providing "A fact finder should be aware . . . of the distortion caused by hindsight bias . . . .")

case because the claims involve the chemical arts which are unpredictable.[22] In sum, Mahmood is an inappropriate reference for an obviousness rejection of the claims. Accordingly, Applicants respectfully request that the Board reverse Appellee's rejection of the claims.

3. Zuzich describes a completely different reaction from that described in the claims

Appellee makes an alternative argument to address the deficiencies of Wojtowicz. Appellee relies on Zuzich as teaching adding the reactant at intervals in an endothermic reaction of anhydrous metal and hydrofluoric acid.[23] Appellee relies on Zuzich despite the fact that Zuzich involves an exothermic reaction instead of an endothermic reaction as recited in, for example, claim 1.[24] Furthermore, Zuzich discloses preparing polyethercyclicpolyol by heating an alkali or alkaline earth metal hydroxide with a polyol and epihalohydrin or epoxy alcohol to initiate an addition reaction, and adding epoxy resin to the addition reaction mixture prior to the addition reaction going to completion instead of the production of metal fluoride.[25] If the exothermic reaction of an alkyl with a polyol is held as relevant to the obviousness rejection of an endothermic reaction between anhydrous metal and hydrofluoric acid, then any chemical reaction exhibiting a temperature change would be relevant to any other chemical reaction exhibiting a temperature change irrespective of the reactants and the type of temperature change. Such a holding would ignore the unpredictability of the chemical arts. Moreover, ignoring these profound differences between the claims and Zuzich is contrary to the dictates of *Graham* which provides that the differences between the claims and the art in an obviousness analysis are important.

4. Conclusion

In sum, Appellee has ignored the differences between the applied art and the invention as a whole and instead has presented diverse pieces of art that contain assorted

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[22] *In re Sichert*, 566 F.2d 1154, 1162, 196 USPQ 209, 217 (CCPA 1977) (recognizing the chemical arts as unpredictable: "we are persuaded that the disclosure of "preferred active ingredient of vital necessity for the cellular respiration" does not provide sufficient guidance to select other operative ointment bases without undue experimentation, considering particularly that an unpredictable art is involved.)

[23] Examiner's Answer, page 9.

[24] *See* Examiner's Answer, page 13 (Appellee concedes Zuzich does not disclose an endothermic reaction)

[25] *See* Zuzich, Abstract.

features of the invention in an attempt to render the claims obvious. Because the rejection of the claims involve hindsight reconstruction of the claims and a consideration of the claims part by part instead of as a whole, Appellants respectfully request that the Board reverse the rejection, under 35 U.S.C. § 103(a), of claims 1 – 34.

D. Conclusion

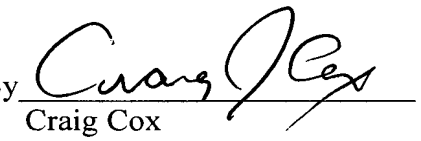
Appellants establish in the Argument above that claims 1 – 24, 26, and 28 – 30 are definite. Further, Appellants establish in the Argument above that claims 1 – 34 are patentable over the applied art. Accordingly, Appellants respectfully request that the Board reverse the current rejections.

III. CLAIMS APPENDIX

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

Dated: May 14, 2008

Respectfully submitted,

By 

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[25] *See* Zuzich, Abstract.

VIII. CLAIMS APPENDIX

1. A process for the production of metal fluorides comprising:

introduce a predetermined weight of anhydrous hydrofluoric acid into a reaction vessel set to a predetermined reaction temperature and initiate a mixing action;

preheat a predetermined weight of anhydrous metal to the predetermined reaction temperature;

introduce aliquots of the anhydrous metal into the anhydrous hydrofluoric acid in said reaction vessel at intervals until the entire predetermined weight of the anhydrous metal has been added, wherein the anhydrous metal reacts endothermically with the anhydrous hydrofluoric acid;

remove excess anhydrous hydrofluoric acid from the reaction vessel; and

remove a metal fluoride resultant product from the reaction vessel.

2. The process of claim 1 wherein the mixing action is selected from the group consisting of:

rotation,

stirring and

agitation.

3. The process of claim 1 wherein the anhydrous metal is a metal compound.

4. The process of claim 1 wherein the predetermined weight of anhydrous metal is introduced into the reaction vessel through a plunger device and port designed for such purpose.

5. The process of claim 1 further comprising:

exhausting an internally generated gaseous resultant product.

6. The process of claim 5 wherein the internally generated gaseous resultant product is exhausted through an automatic regulating gas back-pressure valve.

7. The process of claim 1 wherein, after reactants have been fully introduced into the reaction vessel, the reaction vessel is maintained at a predetermined reaction pressure and temperature for a minimum period of time.

8. The process of claim 7 wherein the minimum time is four hours.

9. The process of claim 1 wherein the excess anhydrous hydrofluoric acid is removed from the reaction vessel by evaporating the excess acid through a gas backpressure valve.

10. The process of claim 1 further comprising:

place the resultant metal fluoride product in an appropriately designed and constructed open container; and

place the container and its contents in an oven capable of maintaining an inert environment while heating the metal fluoride.

11. The process of claim 10 further comprising:

heating the resultant metal fluoride at 95°C ±4°C for a period of approximately two hours.

12. The process of claim 11 further comprising:

after heating the metal fluoride at 95°C ±4°C, bring the temperature of the metal fluoride to within 10°C of the metal fluoride's decomposition or melting point, whichever temperature is lower.

13. The process of claim 12 further comprising:

cooling the metal fluoride to ambient temperature in a sealed desiccator that is free of moisture and stray gases.

14. The process of claim 1 wherein the reaction vessel is capable of withstanding exposure to the anhydrous hydrofluoric acid and capable of operating under internal system working pressures in the range of zero to 400 psia and temperatures in the range of -200°F to 300°F.

15. The process of claim 14 wherein the reaction vessel is equipped with an automatic regulating gas back pressure valve, settable at back pressures ranging from zero psia to 400 psia.

16. The process of claim 14 wherein the reaction vessel is equipped with a plunger-type device that allows solid, granular reactant materials to be introduced to the reaction vessel, while the reaction vessel is under vacuum or pressure, without allowing fluids to escape from or enter into the reaction vessel.

17. The process of claim 1 further comprising:

purging the reaction vessel a minimum of three successive times with pure nitrogen gas; and

filling the reaction vessel with pure nitrogen gas to the pressure at which it is intended to conduct the reaction.

18. The process of claim 1 wherein the aliquots are 10% of the entire predetermined weight of the anhydrous metal.

19. The process of claim 1 wherein the aliquots are added using a plunger-type device that allows solid, granular reactant materials to be introduced to the reaction vessel, while the reaction vessel is under vacuum or pressure, without allowing fluids to escape from or enter into the reaction vessel.

20. The process of claim 1 wherein the weight ratio of the anhydrous hydrofluoric acid to anhydrous metal is a multiple of the stoichiometric combining weight of the metal reactant.

21. The process of claim 20 wherein the weight ratio is not less than 2 and not greater than 60.

22. The process of claim 20 further comprising:

determining an optimum weight ratio comprising:

producing batches of the metal fluoride at various ratios; and

rating the resultant metal fluoride product by its suitability for an intended application of such product.

23. The process of claim 1 wherein the process of removing excess anhydrous hydrofluoric acid from the reaction vessel comprises:

progressively reducing a set pressure on a gas backpressure valve, while maintaining a temperature above 19.8°C on the reaction vessel, until all of the anhydrous hydrofluoric acid has volatilized.

24. The process of claim 23 further comprising:

passing the volatilized vapor phase anhydrous hydrofluoric acid through a heat exchanger to reduce the temperature below the condensation temperature at standard atmospheric pressure; and

recovering and condensing the anhydrous hydrofluoric acid for use in the process again.

25. The process of claim 31 wherein the metal is anhydrous.

26. The process of claim 1 wherein the anhydrous metal is less than essentially chemically pure or not chemically pure.

27. The process of claim 31 wherein the hydrofluoric acid is anhydrous.

28 The process of claim 31 wherein the reaction vessel is set at a temperature other than the a predetermined reaction temperature.

29. The process of claim 31 wherein the metal is preheated, prior to introduction into the hydrofluoric acid, to a predetermined reaction temperature.

30. The process of claim 31 wherein the metal is preheated, prior to introduction into the hydrofluoric acid, to a temperature other than a predetermined reaction temperature.

31. A process for the production of metal fluorides comprising:

providing hydrofluoric acid in a reaction vessel;

introducing aliquots of a metal reactant into the hydrofluoric acid in the reaction vessel at intervals until a predetermined weight of the metal has been added, wherein the weight ratio of the hydrofluoric acid to metal is a multiple of a stoichiometric combining weight of the metal;

agitating the hydrofluoric acid and metal reactants in the reaction vessel;

venting excess hydrogen chloride gas generated during a reaction between the hydrofluoric acid and metal reactants; and

maintaining the hydrofluoric acid and metal reactants at a predetermined pressure and predetermined temperature for a minimum period following the introduction of the metal reactants.

32. The process of claim 31 further comprising:

removing a resultant metal fluoride product from the reaction vessel;

heating the metal fluoride product; and

placing the metal fluoride product in a desiccator.

33. The process of claim 31 wherein the hydrofluoric acid and metal reactant are anhydrous.

34 A process for producing ferric trifluoride comprising:

providing hydrofluoric acid in a reaction vessel;

introducing ferric trichloride into the hydrofluoric acid in the reaction vessel at intervals until a weight ratio of the anhydrous hydrofluoric acid to the ferric trifluoride is between 2 and 60;

agitating the hydrofluoric acid and ferric trichloride in the reaction vessel;

venting excess hydrogen chloride gas generated during a reaction between the hydrofluoric acid and ferric trichloride;

removing excess anhydrous hydrofluoric acid from the reaction vessel; and

removing a ferric trifluoride resultant product from the reaction vessel.